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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/796,320

03/10/2004

Michael Failes

P1004

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7590

02/23/2006

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EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/796,320

Applicant(s)

FAILES, MICHAEL

Examiner

Michael A. Lyons

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 031004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: the specification fails to have cross-reference to the foreign priority claim. See 37 CFR 1.78 and MPEP § 201.11.

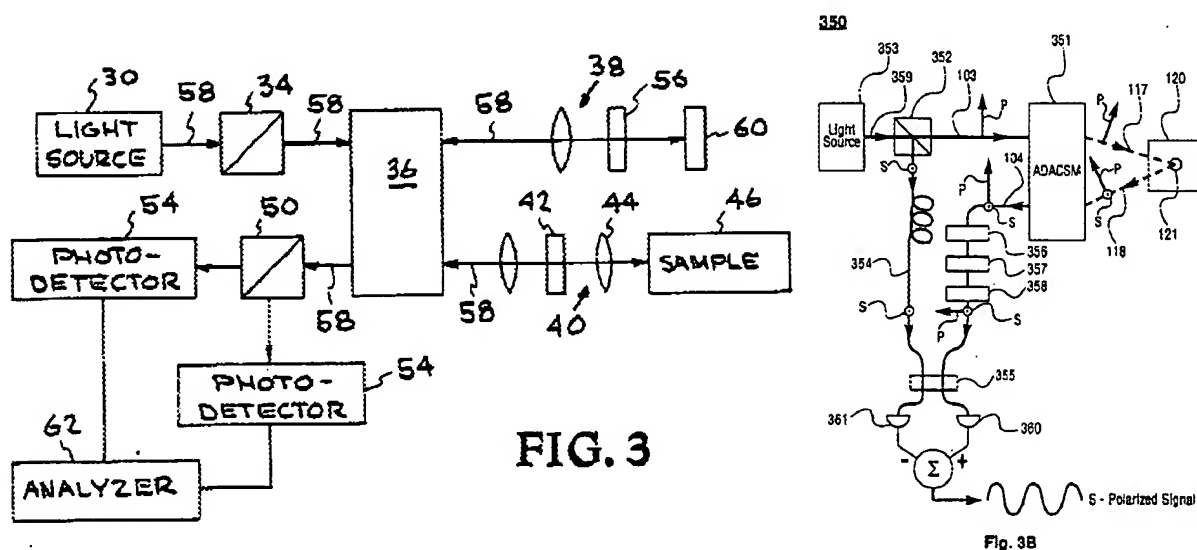
Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Everett et al (6,522,407) in view of Mandella et al (6,411,356).



Regarding claim 1, Everett (Fig. 3) discloses a scanning interferometer comprising a light source 30, and a fiber optic assembly comprising a polarization maintaining fiber 58 having P

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and S modes, splitting means 36 for splitting the incoming polarized light beam to a reference arm 38 and a measurement arm 40, a not shown optical path length modulator (Col. 7, lines 54-57), and a reference mirror 60.

Everett, however, fails to explicitly disclose the splitting means splitting the incoming light where the S polarization mode propagates specifically in one arm and the P polarization mode propagates specifically in the other arm.

Mandella (Fig. 3B) discloses a fiber coupled apparatus where light input from polarization maintaining optical fiber 359 is split by splitting means 352 into S polarization that propagates in reference fiber 354 and P polarization that propagates in measurement fiber 103.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to split the polarized input light of Everett so that the S mode travels in the reference arm and the P mode travels in the measurement arm as per Mandella, the motivation being that, by splitting the light into its respective polarization modes, the device can “provide specific information pertaining to the polarization state of light upon being reflected from a polarization-altering, such as birefringent-scattering, medium” (Mandella, Col. 22, lines 44-50).

As for claim 2, fast and slow birefringent axes with fast and slow propagation modes are inherent to any polarization maintaining optical fiber, as the stress generated during manufacture of the fiber is all that is needed to create the birefringent axes through which the individual polarization modes travel.

As for claim 3, Everett discloses analyzer 62.

As for claim 4, Everett discloses detector 54.

As for claim 5, Everett discloses the possible use of a “piezoelectric transducer system to vary the length of the reference arm fiber and/or the sample arm fiber” (Col. 7, lines 54-57).

As for claim 6, the fiber-stretching device would inherently have low polarization mode dispersion; otherwise, using a stretcher with high polarization mode dispersion would defeat the purpose of using polarization-maintaining fiber, as the polarization of the light at the stretcher could be easily altered by external variations.

As for claims 7 and 8, “the source 30 is typically a broad bandwidth (on the order of 50 nm) amplified spontaneous emission (ASE) source such as a superluminescent diode or fiber ASE source operating in the visible or near infrared” (Col. 6, lines 35-39).

As for claim 9, Everett discloses the use of a polarizing beam splitter or fiber coupler 36, with the beam splitter being replaced by a fiber coupler when a fiber optic arrangement is used (Col. 7, lines 43-49).

Regarding claim 11, Everett (Fig. 3) discloses a scanning interferometer comprising a light source 30 that is typically a broad bandwidth (on the order of 50 nm) amplified spontaneous emission (ASE) source such as a superluminescent diode or fiber ASE source operating in the visible or near infrared” (Col. 6, lines 35-39), and a fiber optic assembly comprising a polarization maintaining fiber 58 having P and S modes and inherent fast and slow birefringent axes supporting fast and slow propagation modes, polarizing splitting means 36 for splitting the incoming polarized light beam to a reference arm 38 and a measurement arm 40, a not shown optical path length modulator (Col. 7, lines 54-57) and fiber stretching device that varies the “length of the reference arm fiber and/or the sample arm fiber” (Col. 7, lines 54-57) that would inherently have low polarization mode dispersion; otherwise, using a stretcher with high

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polarization mode dispersion would defeat the purpose of using polarization maintaining fiber, as the polarization of the light at the stretcher could be easily altered by external variations, a reference mirror 60, an analyzer 62, and a photodetector 54.

Everett, however, fails to explicitly disclose the splitting means splitting the incoming light where the S polarization mode propagates specifically in one arm and the P polarization mode propagates specifically in the other arm.

Mandella (Fig. 3B) discloses a fiber coupled apparatus where light input from polarization maintaining optical fiber 359 is split by splitting means 352 into S polarization that propagates in reference fiber 354 and P polarization that propagates in measurement fiber 103.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to split the polarized input light of Everett so that the S mode travels in the reference arm and the P mode travels in the measurement arm as per Mandella, the motivation being that, by splitting the light into its respective polarization modes, the device can “provide specific information pertaining to the polarization state of light upon being reflected from a polarization-altering, such as birefringent-scattering, medium” (Mandella, Col. 22, lines 44-50).

Allowable Subject Matter

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

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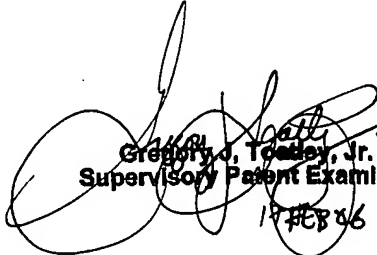
As to claim 10, the prior art of record, taken either alone or in combination, fails to disclose or render obvious the scanning interferometer of claim 1 with the splitting means being a coupler having four polarization maintaining fiber ports, one of which is orientated with birefringent axes orthogonal to the other three ports, in combination with the rest of the limitations of the above claim.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,861,127 to Failes (optical coupler that shows the inherency of birefringent axes in polarization-maintaining fibers) and US Pat. 5,459,570 to Swanson et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Gregory J. Toatley, Jr.
Supervisory Patent Examiner
1/28/06

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAL

February 14, 2006